

# **Decentralized Wastewater Treatment Technologies SAG Meeting Summary November 2, 1999**

**Jekyll Island, Georgia**

## **Opening Comments**

The meeting was chaired by Tom Stevens, the NSF Pilot Manager for the Source Water Protection Environmental Technology Verification (ETV) Pilot. Fifty-three persons, including the Stakeholder Advisory Group (SAG) members present, participated in the meeting. A list of meeting participants is included in [Attachment 1](#). Jim Converse was welcomed as a new SAG member, representing the American Society of Agricultural Engineers. Mr. Stevens read the NSF anti-trust statement and self-introductions were made.

## **Pilot Update**

An overview of the ETV Source Water Protection Pilot activities outside of the decentralized wastewater treatment area was provided. A second SAG, to address infrastructure and watershed protection technologies, has been established and will hold its initial meeting on November 18 in Baltimore, Maryland. This SAG will initially focus on developing verification protocols for infrastructure rehabilitation (coatings and grouts) and animal waste management. Partnerships are being formed in each of these focus areas. NSF will be working with the University of Houston's Center for Innovative Grouting Materials and Technology on the review and revision of coating and grout protocols they have developed to date. NSF is also forming a partnership with North Carolina State University's Center for Animal and Poultry Waste Management in the animal waste management area. Mr. Stevens noted that other potential infrastructure and watershed protection areas for technology verification include precision agriculture, soil stabilization and spill control, with other technologies to be identified.

Outreach activities for the pilot, including trade shows, conferences, and exhibitions, were discussed. Because the success of the pilot depends on widespread stakeholder involvement, notice of upcoming events is publicly available. Upcoming pilot events are posted on the internet at [www.epa.gov/etv](http://www.epa.gov/etv) and are announced in *ETVoice*, a service highlighting ETV activities in a newsletter emailed to a list of recipients.

## **Update of Management Standards for Decentralized Systems**

Bob Rubin, on special detail to USEPA from North Carolina State University, provided an update of the national voluntary management standards being developed by EPA for decentralized systems. Development of voluntary standards was mandated by the Clean Water Action Plan (1998), which highlighted failing decentralized systems as an ongoing national concern. In response to the Action Plan, EPA is working with its partners to implement an initiative to promote the benefits of onsite/decentralized wastewater systems and to promote proper management of such systems. EPA will examine the strengths and weaknesses of existing programs for managing decentralized systems. For example, in Washington, all onsite systems will have to be inspected on an annual basis starting in 2000. Florida has already implemented a management program for decentralized systems. EPA will provide guidance for establishing new management programs at a number of different levels/scales. By providing information about different management options, communities can pick and choose those elements that make the most sense for them. Management will be stressed - if the owners of decentralized systems do not want to have to deal with maintenance people on a regular basis, they may want to consider central sewers.

Critical components of decentralized system management include environmental/ecosystem sensitivity, treatment system complexity, and the scope of management services. Local training and certification programs are needed. Other important components affecting the management of decentralized systems include the capabilities of local service providers, the administrative, technical, and financial resources of the authority, and legal authority of the authority (i.e., what types of legislation enable them to act as management authorities). Potential management service providers include federal, state, local, utility district, quasi-public (for example, a rural electric cooperative), and private individuals.

### **Status of Protocol Development: Nutrient Reduction**

Nutrient reduction was identified during previous meetings of the SAG as the technology area that would benefit most from verification. To date, the Nutrient Reduction Technology Panel has held two conference calls to discuss key elements to be included in the protocol. Both nitrogen and phosphorus reduction by end-of-pipe technologies will be addressed by the protocol.

EvTEC, the independent ETV pilot, is also working on a protocol for verification of denitrification systems. NSF and EvTEC agreed that developing a joint protocol between the two pilots would be beneficial to ensure consistent evaluations of these technologies under the ETV program. Jenice Dunn of EvTEC provided background information about the origin of the EvTEC effort in this technology area. The Pennsylvania Department of Environmental Protection contacted EvTEC to inquire about developing a protocol for technologies performing denitrification, with particular interest in obtaining verification of systems serving small, farming communities, with flows of 400 to 10,000 gpd. PADEP is also placing high importance on energy savings.

The Nutrient Reduction Technology Panel stressed that costs associated with testing need to be reasonable. There have been lengthy Panel discussions regarding testing under controlled conditions versus testing at field locations, with agreement that testing should be conducted under controlled conditions. This will ensure reproducibility of the test method and will facilitate sampling. The Technology Panel recommended a minimum of a year for testing, though they would prefer it to be longer. The recommendation for longer evaluations may lead to a phased verification approach, which would enable the Pilot, following verification of the technology performance, to gather O&M data over a longer period of time.

There was a question from the SAG regarding how the O&M procedures would be performed during the course of verification testing. Addressing problems at the time they arise may not be indicative of real world conditions. However, the verification report will record the extent to which monitoring and other O&M procedures occur during the course of testing. The Technology Panel had determined that vendors should have the option of O&M being performed by their representative, though their access to the site would be controlled by the testing organization. Any adjustments will be monitored and recorded and careful documentation will be maintained.

Ms. Dunn also provided an overview of the EvTEC pilot's purpose and history. EvTEC is the independent ETV pilot. As such, it does not focus on one particular technology or environmental area. EvTEC develops protocols based on a market-based approach, concentrating on sustainable technologies. In addition, they identify existing funding sources within the marketplace. Their collaboration with the Source Water Protection Pilot on nutrient reduction technologies will produce one protocol and, possibly, one evaluation.

An initial draft nutrient reduction protocol has been written and will be distributed to the Technology Panel in early December. A meeting participant questioned whether this program will be accepted by regulators. Mr. Stevens explained that there is no guarantee of this, but the Source Water Protection Pilot regularly emails pilot updates to a state regulator distribution list and involves regulators on various stakeholder groups.

A regulator from Florida described his state's permitting process for onsite systems for commercial waste. Systems certified under NSF Standard 40 are accepted based on the certification. Other systems may be permitted provided sufficient testing data are submitted, in addition to a PE stamp on the engineering design. The primary reason NSF certification is more readily acceptable is the fact that it involves a *third-party evaluation*. The same would hold true for technologies evaluated under the ETV Program.

It was suggested that pumpers/haulers and installers be added to the Nutrient Reduction Technology Panel. Mr. Stevens requested the names of people that should be added to either the Technology Panel or the mailing lists.

## **Status of Protocol Development: High Strength/Commercial Wastewater Treatment**

Dick Otis from Ayres Associates, who is developing the protocol for high strength/commercial wastewater treatment, provided an update. He explained that high strength waste could encompass wastewater generated by a bakery, laundromat, or restaurant. Based on the Technology Panel's review of available data for high strength waste, they decided to define it as waste with one or more constituents at a level exceeding domestic levels. Without this broad definition, it would have been difficult to address the variety of types of high strength waste that could be considered under the protocol. Field testing is required to assure that technologies can be used in the applications against which they are being verified. It is likely that the wastewater volume and characteristics will vary from verification to verification. It is important to remember that verification testing is not being conducted to compare different technologies, but evaluate an individual technology. The Technology Panel recommended that the test period be one year from the point where the system achieves steady state. The draft protocol has been completed by Ayres Associates and will be distributed to the Technology Panel for further review and comment. Following discussion, there was support for excluding any numeric definition of high strength/commercial waste.

## **Status of Protocol Development: Package Wastewater Treatment Technologies**

Tom Stevens provided an update of the activities to date of the Package Plant Technology Panel. He explained that this protocol will evaluate package plant technologies that are used to treat domestic strength wastewater under non-residential conditions, such as schools and mobile home communities. Though no specific upper limit has been defined for these technologies, the protocol's lower limits will not overlap Standard 40 (i.e., technologies having treatment capacities greater than 1,500 gallons per day).

It was questioned whether a technology that is not an aerobic treatment unit and yet performs the same function as technologies certified under Standard 40 could be evaluated under the Source Water Protection Pilot. Mr. Stevens noted that Standard 40 is not limited to aerobic systems alone, and may be applied to other types of technologies. In addition, due to the limited resources and time available to the Source Water Protection Pilot, it is most prudent, both in terms of economics and beneficial environmental impacts, to develop protocols for technologies that are not currently addressed under existing programs. One meeting participant questioned whether by choosing not to duplicate existing efforts when choosing technology areas for verification, NSF is eliminating potential competition in its certification area. Tom Bruursema, General Manager of NSF's Environmental Research Services, explained that both ETV protocols and NSF standard become part of the public domain once finalized. This would provide other testing organizations the opportunity to evaluate products against these procedures.

## **Status of Protocol Development: Disinfection Technologies**

A Disinfection Technology Panel is currently being formed under the Pilot. This group will look at a variety of technologies used for disinfecting wastewater, including chlorine, chlorine dioxide, UV, ozone, and others. Protocols developed by this technology panel are not expected to limit technologies according to system size.

## **Policy Issues**

Mr. Stevens reiterated that the Source Water Protection Pilot has a limited amount of time and resources with which to achieve an ambitious number of verifications. If there is little vendor interest in verification within a given technology area, then there is little value to be gained from developing new protocols, regardless of their technical quality. Protocols should be developed in technology areas with vendors that acknowledge the value of verification. In response to several inquiries about the verification process from "one-of-a-kind" technologies, Mr. Stevens suggested that the SAG consider a commitment fee, to be paid by vendors requesting verification. This commitment fee of three to five thousand dollars would serve to gauge a vendor's commitment to the process. This fee would be non-refundable, but would be applied to the cost of testing if a protocol is developed. The fee would accompany the application, which will require the vendor to describe the technology and their expectations of verification.

Mr. Stevens suggested forming technology review subcommittees, consisting of four to six members, to assist in screening for technical soundness technologies that may potentially be verified under the Pilot. The members of these committees would also assist in identifying technology panel members and in the review of test plans. There was initial support from the group for this idea. However, following discussion, it was suggested that NSF continue to evaluate the approach, since the process may restrict technologies. Mr. Stevens assured the group that the vendor would have the opportunity to appeal decisions to the entire SAG if the subcommittee turned their technology down. The concept was shelved at this time.

In further discussion, it was explained that there will be ongoing review of protocols to update them, especially following the initial round of testing. Also, meters and monitors could be used to lessen the cost of verification testing while providing additional information about the process, such as peak flow conditions, etc. It was also pointed out that use of meters or monitors for parameters identified in a protocol as essential would need to be reviewed in light of the need for verifying the operation of the equipment. There was discussion about the use of existing data for verification of technologies. Mr. Stevens explained that there are provisions for incorporating preexisting data into the verification process, but the requirements are quite stringent, and involve more than the use of EPA-approved test methods.

Maren Roush (NSF International) explained the basic procedures involved in protocol and test plan development, and how the process will vary depending on whether development of the protocol is recommended by the SAG or a vendor approaches the

pilot to request protocol development. Ms. Roush indicated that in cases where the SAG recommends development of a protocol, vendor solicitation for testing against the protocol would occur as the protocol is being developed. In cases where vendor action initiates protocol development, vendor solicitation would occur prior to the start of protocol development. In either case, vendors will have input to the process by providing comments during protocol development. In cases where there is only one technology vendor, the vendor will participate in developing the test plan prior to the initiation of any testing.

## **Vendor Meetings**

Tom Stevens explained that vendor meetings will be used to call together different vendors of a technology prior to the development of a final protocol to inform them about the ETV process and request their input in protocol development. It was suggested that NSF poll the vendors that would potentially participate in a meeting to determine the best date and location. One suggested opportunity for a vendor meeting is the Small Drinking Water and Wastewater Systems Symposium, cosponsored by NSF International and the Rural Water Research & Education Foundation. This symposium will take place in Phoenix, Arizona, from January 12-15, 2000.

## **Other Technology Areas for Consideration**

Meeting participants were asked to provide input about potential technology areas for consideration under the Pilot. From the discussion, the following technology areas were suggested:

- Drip irrigation
- Watertight tanks and leakproof fittings
- Septic tank additives
- Cleaners (do they have an antibacterial effect in decentralized systems?)
- Grease traps/interceptors
- Reuse/recycle systems
- Disposal technologies

There was general support for pursuing drip irrigation as a technology area for verification under the Pilot. After some discussion, it was agreed that the filtration step, prior to the irrigation system, is the most verifiable element of drip irrigation, with its performance and maintenance over time being examined. It may be more difficult to verify the performance of emitters as well as the performance of the system as a whole, since this would vary based on soil type. The group suggested that manufacturers and installers of drip irrigation technologies be identified and encouraged to participate on a Technology Panel.

Regarding verification of watertightness of precast concrete tanks, it would be difficult to evaluate the processes effectively because of the variability found in concrete tanks cast on different days.

There was concern about evaluating septic tank additives under the Source Water Protection Pilot, since there may be more tendency for individual consumers, as opposed to regulator and consulting engineers, to misinterpret a verification report for an additive that did not perform well. There was also concern that consumers may see the EPA name and assume that the report is positive. Anti-bacterial cleaners are also a concern, for the same reason. With other products, regulators will use the reports to make decisions, whereas consumers would be the ones to decide whether or not to use a specific cleaner. The change of formulation of the cleaners by a vendor, and how the verification program would address this, was also brought up during discussions. Mr. Bruursema suggested that if you look at cleaners from a decentralized standpoint, there may not be a strong need for verification, whereas if you look at them from a source water protection standpoint, there is a lot more value. This matter will be considered by NSF for future Pilot activity.

Gravelless systems were discussed, and the main question raised was how the technology would be evaluated since the soil is used as a treatment component in the system. It was suggested that in order to make these types of evaluations statistically valid, there would need to be multiple test sites. However, the amount of time that would be needed to evaluate soil systems may exceed the time frame for the pilot. There is also a great degree of variability between soils, and even within one soil type. One participant suggested that if the verification test were performed during a high risk season, it would still provide valuable data.

The importance of statistical data was discussed, and it was suggested that provisions for obtaining these data should be clearly outlined in the protocols, especially with respect to characterizing influent. There was discussion regarding the importance of ensuring that the Pilot addresses more than just mechanical, end of pipe technologies. Several meeting participants stressed that it would be beneficial to address soil-based systems under the Pilot, if possible. The group agreed that it may be difficult to verify soil-based systems during the time allotted to the pilot. It was suggested that consideration be given to use ETV process to do epidemiological-type evaluation of claims based upon "statistically valid" analysis of actual systems in the field. This may be an appropriate means to evaluate drainfield technologies; long-term effluent filter performance; etc.

## **Future Activities and Meetings**

Tom Stevens explained that NSF will notify people on its mailing list when protocols are available for review. A copy will be forwarded to anyone requesting one. Draft protocols will be posted on the NSF and ETV web sites during the open comment period. Final protocols will also be posted on these two web sites.

Mr. Stevens proposed holding the next SAG meeting in conjunction with the next National Environmental Health Association (NEHA) conference, which is scheduled for June 2000, in Denver. If the need arises for an additional meeting in the meantime, NSF will schedule one. One potential scheduling conflict to consider is National Small Flows



Clearinghouse's next state regulator meeting on June 11-13, 2000. NSF will consider the next meeting date.

---

## **Attachment 1**

### **ETV Source Water Protection Pilot Decentralized Wastewater Technologies Meeting Participants**

<b>Participant</b>	<b>Organization</b>	<b>Classification <sup>(1)</sup></b>
Jim Anderson	University of Minnesota	University
Susan Austin	N.C. Dept. of Environment and Natural Resources	State/regulator
Stephanie Barrett	ICF Consulting	Other
Steven Berkowitz	N.C. Division of Environmental Health	State/regulator
Paul Booher	Florida Dept. of Health	State/regulator
Steven Broband	BioSolutions, Inc.	Manufacturer/vendor
Tom Bruursema	NSF International	Other
A.L.A. Bryanton	Advanced Wastewater Treatment Systems Inc.	Manufacturer/vendor
Matt Byers	Zoeller Company	Manufacturer/vendor
Peter Casey*	National Small Flows Clearinghouse	Other - Information Organization
Charles Chambers	Advanced Wastewater Treatment Systems Inc.	Manufacturer/vendor
Jim Converse*	American Society of Agricultural Engineers	Trade association, users
Edward Corriveau	Pennsylvania Dept. of Environmental Protection	State/regulator
Stephen Dix	Infiltrator Systems, Inc.	Manufacturer/vendor
Gig Drewery	Hydro-Action	Manufacturer/vendor
Jenise Dunn	Civil Engineering Research Foundation - EvTEC	Other
Carl Etnier	Agricultural University of Norway	University



Paul Flynn	Bio-Microbics	Manufacturer/vendor
Ray Frederick	U.S. Environmental Protection Agency	Federal government
Tom Grizzard*	American Water Works Association	Trade association
Tom Groves*	New England Interstate Water Pollution Control Comm.	State/regulators
Bob Guthrie	Guthrie & Associates, Inc.	Consultant
Brenda Guy	Delta Environmental Products	Manufacturer/vendor
Anish Jantrania	Virginia Dept. of Health	State/regulator
Roman Kaminski	Wisconsin DILHR	State/regulator
Truett Kastner	Clearwater Inc.	Manufacturer/vendor
Jay Knight	Knight Treatment Systems	Manufacturer/vendor
Masao Kondo	N.C. State University	University
J. Robert Krebs	Krebs Consulting	Consultant
Ron Lindsay*	National Ground Water Association	Trade association
Calvin Locker	Consolidated Treatment Systems	Manufacturer/vendor
Francis Lombardi	Stelling Co., Inc.	Manufacturer/vendor
Siegfried Maunoir	EPARCO	Manufacturer/vendor
Valerie Nelson*	Coalition for Alternative Wastewater Treatment	Trade association
Ken Neu	Environmental/Health Products and Services	Manufacturer/vendor
Mark Noga	Knight Treatment Systems	Manufacturer/vendor
Mark Ostlie	SJE-Rhombus	Manufacturer/vendor
Richard Otis *	Ayres Associates	Consultant
Brent Parker*	Association of State Drinking Water Admin.	State/regulator
Raymond Peat	Bio-Microbics	Manufacturer/vendor
Luke Robitaille	Premier Tech Environment	Manufacturer/vendor
Maren Roush	NSF International	Pilot partner
Robert Rubin	N.C. State University	University
Quay Schappell	Cromaglass Corporation	Manufacturer/vendor
Anthony Smithson*	Lake Co. (IL) Health Dept.	State/regulator
Steve Steinbeck	N.C. Dept. of Environment and Natural	State/regulator

	Resources	
Larry Stephens	Stephens Consulting Services	Consultant
Tom Stevens	NSF International	Pilot partner
Richard Still	Advanced Wastewater Treatment Systems Inc.	Manufacturer/vendor
Bill Stuth	NCS	Manufacturer/vendor
John Trax*	National Rural Water Association	Trade association
Bob Uebler	N.C. Dept. of Environment and Natural Resources	State/regulator
Donna White	Bio-Sun Systems	Manufacturer/vendor
Al White	Bio-Sun Systems	Manufacturer/vendor

<sup>(1)</sup> State/regulators (S/R); Manufacturer/vendor (Ven); Federal government (Fed); Trade association (Trade); Universities (Univ); Consultants (Con); Other (O - designate).

\* Stakeholder Advisory Group members.

---